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ABSTRACT

The two part presentation presents information on specific conditions of developmental delay and suggests intervention approaches. Three causes of mental retardation (Down's syndrome, Fetal Alcohol Syndrome, and cerebral palsy) are identified and described in terms of definition, incidence, characteristics, and educational implications. Part II is designed to help participants become familiar with specific remediation/intervention strategies in four areas: cognitive or preacademic skills, social/emotional development, self help skills, and occupational and physical therapy. Cognitive interventions are discussed in terms of teaching discriminations and receptive language. The role of ignoring inappropriate behavior is considered, and the techniques of prompting, fading, and backward chaining are described. (CL)

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All Our Children: Handicapped and Normal

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Abstract

This presentation described three major handicapping conditions and common interventions on delayed development in four areas. The three handicapping conditions described were Down's Syndrome, Fetal Alcohol Syndrome, and Cerebral Palsy. Definitions, incidence, characteristics, and educational implications were discussed. Four major interventions which could be made with handicapped pre-school children were also discussed. These interventions were in the cognitive, social/emotional, physical therapy, and self-help areas.

Part I -- Delayed or Abnormal Development

This is the first of two modules. It will focus on delayed or abnormal development.

The following are primary causes of mental retardation:

1. Toxic or teratogenic agents
2. Genetic anomalies
3. Brain injury during or after birth
4. Infections at birth
5. Physical injury
6. Metabolic or nutritional problems
7. Abnormal growths in the brain.

For this module, we will focus on three causes: (a) genetic, as in Down's Syndrome, (b) toxic agents, as in Fetal Alchohol Syndrome, and (c) brain injuries as in Cerebral Palsy. The objective for this presentation is that the learner will recognize and identify primary characteristics of Down's Syndrome, Fetal Alchohol Syndrome, and Cerebral Palsy.

Down's Syndrome

Definition. Down's Syndrome is a genetic condition also known as mongolism, which results in a variety of birth defects causing mild to profound mental retardation. Down's Syndrome is not usually considered as a hereditary condition except possibly in the case of the translocation form of Down's Syndrome.

Incidence. The incidence of Down's Syndrome is approximately 1 in 600 births. The chance that a young mother would have a Down's Syndrome child is 1 in 2,000 and increases to 1 in 40 for mothers over

45 years of age.

Types of Down's Syndrome. The majority of cases (95%) are in the trisomy category. The fetus has a genetic complement of 47 rather than the normal 46 chromosomes. It is a situation that evolved at conception. It is considered a genetic mutation or accident of nature.

Translocation occurs in about 4% of the Down's Syndrome births. The infant possesses the normal complement of 46 chromosomes; however, the chromosome has been translocated onto a different chromosome rather than the normal cell division. This condition can be inherited or it can also occur as a mutation from parents with the normal chromosomal complement.

The mosaic type of Down's Syndrome occurs in 1% of the cases. Subsequent to conception there are errors in cell division, which results in a distribution of cells with the normal 46 and the altered 47 chromosomal complement.

Characteristics. Characteristics of Down's Syndrome include the following:

1. Overall height, weight and physical strength is generally below average.
2. Small brachycephalic (flattened posteriorly) head.
3. Epicanthic folds (fold of skin in the inner corner of the eye.).
4. Brushfield spots in the eyes (speckling within the iris.).
5. Eye complications, such as myopia and strabismus.
6. Low "saddle" bridge of nose.

7. Ears may be low set and malformed.

8. Small mouth with fissured protruding tongue and irregular dentition.

9. Hands are broad and short with stubby fingers. Fifth digit may be curved inwardly.

10. Palmar crease (simian) may be present.

11. Feet broad and short. There may be a wide space between the first and second toes and a plantar crease.

12. Skin and muscles may be hypotonic. This is often combined with hypermobility of joints resulting in greater than average flexibility.

13. Frequent occurrence of cardiovascular, bowel and/or respiratory difficulties.

Educational implications. Special education and training is generally required ranging from self-contained classes to integration in regular classrooms.

Life skills in adolescence and adulthood can range from situations of continuous supervision to almost complete independence with only minimal supervision by family or other social agency representative; vocational skills can allow an individual to be employed and to contribute to his livelihood.

It is advantageous for a child to participate in an infant stimulation or pre-school program in order to maximize his mental/physical development. With professionals and parents coordinating efforts to facilitate development, one can anticipate a child being able to more readily benefit from educational programs thereby increasing knowledge and skill levels.

Support services may include speech pathology, occupational therapy and/or physical therapy. Medical supervision and follow-up will vary and will likely become less frequent as the child grows.

Fetal Alcohol Syndrome

Definition. Fetal Alcohol Syndrome (FAS) is a pattern of congenital malformations associated with fetal exposure to alcohol.

Incidence. It is estimated that children born with fetal alcohol syndrome number two live births per 1,000 (Handon, Streissguth & Smith, 1978). This may be an underestimate as some children may do undiagnosed if the characteristics are not readily apparent.

Characteristics. The three primary features of fetal alcohol syndrome are:

1. Central nervous system dysfunction.
   - mild to moderate mental retardation.
   - microcephaly
   - poor coordination
   -hypotonia(poor skin/muscle tone)
   - irritability in infancy
   - hype activity in childhood
2. Pre and postnatal growth development
   - delayed growth and development
   - underweight at birth (approximately 38% of normal weight)
   - diminished adipose tissue
3. Pattern of facial characterisitcs
   - short palpebral fissures
   - short upturned nose
   - hypoplastic philtrum (space between the tip of the nose and upper lip)

- micrognathia (small teeth)
- strabismus of eyes
- epicanthic folds
- posterior rotation of ears
- heart murmurs
- abnormal palmar creases

Educational implications. The average IQ of children with Fetal Alcohol Syndrome is 68 but the range of IQ is wide. Some children are also born with normal intelligence; however hyperactivity is often reported along with short attention span and distractibility.

It is reasonable to anticipate that the FAS child can benefit from placement in regular classrooms, resource rooms, or with educable retarded children. The FAS child can likely benefit from occupational therapy and speech pathology.

Cerebral Palsy

Definition. The term cerebral palsy translates to brain paralysis. Cerebral palsy is a non-progressive disorder of movement or posture beginning in childhood due to malfunction or injury of the brain. The majority (86%) of individuals with cerebral palsy are born with it and the others (14%) acquire it later in childhood through injuries, diseases or other disturbances.

Incidence. Approximately seven (7) children per 100,000 are born with this condition with the following degrees of severity and subsequent care:

1 - death within the first year.

2 - conditions of such severity that they will require institutional care.

4 - amenable to treatment.

- home or day care (1)
- moderate involvement and can benefit from treatment (2)
- mild involvement - no special treatment required (1)

Types of Cerebral Palsy based on movement. Cerebral palsy can be subdivided into five major types:

1. Spastic - The limb muscle is tight and is subject to strong contraction with any sudden attempted movement or stretching.
2. Athetosis - The limbs exhibit involuntary purposeless movement. Purposeful movements are contorted and assume a twisting motion. Movement can be of nontension or tension type.
3. Rigidity - Severe form of spasticity. Children are usually quadraplegic.
4. Ataxia - Lack of balance or positon in space. Movement is uncoordinated. Children walk with feet apart as if they are rocking from side to side.
5. Tremor - Shakiness of the limb. Tremor might begin onset only when there is an attempt to use the limb.

Causes of Cerebral Palsy. The following are some causes of cerebral palsy:

1. Infections or toxic conditions in the mother during pregnancy such as German measles. Meningitis and lead poisoning are two more examples of conditions that can result in cerebral palsy.

2. Lack of oxygen to the brain before or after birth (anoxia) due to hemorrhage from separation of the placenta, shock due to blood loss (i.e. auto accident) or knotting of the umbilical cord. Other factors include pneumonia, lung collapse, carbon monoxide exposure, drowning, or poisoning or too much drug sedation to relieve distress of labor.

3. Prematurity - A child less than 40 weeks of gestation and weighing less than 5 pounds. This condition accounts for 33 - 60% of all cases of cerebral palsy in the United States.

4. Metabolic disorders, primarily diabetes or toxemia in the mother.

5. Head injuries which can occur in the form of ruptured blood vessels or compression of the brain during birth. In addition skull fractures, brain lacerations or hemorrhages, which are the result of severe insult to the head as in an auto accident, a fall or through battering. Brain tumors and blood clots can also result in cerebral palsy.

Implications for Education. Difficulties in speech/language development are present in close to 50% of children with cerebral palsy. Disorders can be the result of paralysis or incoordination of speech or faulty development of musculature. Children may also be unable to organize and select speech.

Hearing loss is common and occurs primarily in children with athetosis. Visual difficulties include far and nearsightedness and crossed eyes. There can be loss of shape and texture sensation.

Epilepsy is a condition that occurs frequently in cerebral palsied individuals. Mental retardation is seen in approximately 75% of the individuals with cerebral palsy. The remaining 25% have normal or

above normal intelligence.

Perceptual-motor difficulties are common. There is an inability to make the hand (or limb) do what the eyes see such as copying a square or picking up an article.

A cerebral palsied child would have need for services ranging from a self-contained classroom situation to a regular classroom. Support services might include speech pathology, occupational and/or physical therapy. Adaptive equipment such as prone boards, corner chairs, wheelchairs, language boards and other modified equipment and materials.

Part II -- Interventions with Handicapped Children

This is the second of a two-part presentation on the handicapped child. The first part described the characteristics of some handicapping conditions. In this part, we will cover some remedial strategies to use with handicapped children.

The objective of this part is that the participant be able to describe different areas for intervention, and describe procedures involved in these interventions.

Let us suppose we have a child in our pre-school with the following description:

- three years old
- no speech other than some open vowel sounds
- spastic involvement of the left side of his body
- cries excessively
- non-ambulatory; not toilet trained
- shows little attention to his outside environment.

As you can see, here we have a child with a number of different areas in which he needs some work. Today we are going to concentrate on four areas:

1. Cognitive (or pre-academic) Skills.
2. Social/Emotional Development.
3. Self-Help Skills.
4. Occupational and Physical Therapy.

Notice that we are no longer looking at the name or the label of the child's disorder, but the physical and cognitive areas in which we feel the individual child is in need of some special help.

Cognitive Skills

One of the things that was said of our three-year-old child was that he seemed to show little attention to his outside environment. The first question we might ask is, "Does he attend to sound?" If he does routinely attend to sound, we could move on to the next area, namely, does he attend when asked to look, and next, does he respond to his own name? If the child does not reliably attend to sound, there is an issue we must deal with before we can proceed any further with programming. We need to know whether or not he has hearing, and if so, whether there is any loss in need of attention. What we can do in this case is have him evaluated by some passive means, such as EEG or an impedance measure. However, there is an alternative classroom procedure in which we can teach him to attend to sound. He can be taught to make some motor response, such as pressing a lever, when a sound is presented through the earphones. If he learns the task easily, we can assume he hears. Once he has learned such a task, also, he can be taken to an audiologist for a more precise measure of his hearing. When he has learned to attend when asked to "look", and responds to his own name, he can be taught to follow simple gestural commands. The simplest of these are simple imitations: "do this."

Next, he can be taught to locate body parts, identify (by pointing) common objects, and follow a single verbal command. Although we are speaking of these tasks in terms of cognitive skills, what we are generally talking about is receptive language -- the language the child is able to understand. Receptive language is very closely tied to cognition and pre-academic skills.

Also, closely tied with following simple verbal commands are the concepts

of matching-to-sample and discrimination learning. A match-to-sample task could be, "Find a block that looks like this one;" a discrimination task could be: "Give me the red block," when both red and green blocks are available. Colors, shapes and other attributes can be taught in this fashion. Generally, the method employed is to make the discrimination very pronounced at first, and to fade the stimulus a little at a time until it becomes the discrimination which we want the child to learn.

Next we can teach by modeling how to point out his ears, nose, etc., when asked to. "Demonstrates use of objects" is a task such as, "Show me what you do with a hammer." The use of plurals can be acquired through following simple commands: "Give me one block." "Give me some (or three) blocks."

By the time the child has learned tasks at the level of a four or five-year-old, he may well be ready to begin academic tasks. It is also important that training in other skill levels parallel this training. For example, by the time he has begun learning cognitive skills on the 4-5 year-old level, he should also be advancing well in expressive language, if there is no physiological impairment. He also should have developed his fine motor abilities, so that he will be able to manipulate a pencil, crayon, or other small objects he might use in seatwork.

Social/Emotional Development

Remember that we said that the three-year-old in the original example cries excessively. We can consider this a social problem - whether the problem is emotional is difficult to determine here. What we do know is that he is giving us a message, but we are not always sure what that message is. What are some reasons the child

be crying? Three possible reasons are that the child may be wet, in pain, or that he wants attention.

If the child is wet, this is easy to assess. If he is in pain, a doctor should be able to diagnose and treat this problem. Let us suppose, however, the doctor does not find anything and the child is not wet. Could it be that this crying is serving some other purpose?

Suppose he is used to being picked up whenever he cries. Perhaps he has learned to cry in order to receive attention. This is not uncommon for babies but is less appropriate in a three-year-old. What we might do in this case is teach him a more appropriate way of getting attention. What we are really doing is improving his communication skills so that his behaviors can become more appropriate. What are some ways we might achieve this? Three possible ways include the following: ignore, isolate, encourage him to speak.

If he is really crying to gain our attention, he will probably stop if we stop giving attention for crying. One thing we can do, then, is ignore the crying for 30 seconds. If he begins to cry less, we can then begin to attend when he makes some verbal sound other than crying. In this way we can shape some communication skills in the child which will probably lead to better social development.

This model can also be used for other behaviors which do not seem appropriate in young children: give attention to the behaviors you want to encourage; ignore the behaviors you don't want to encourage. You must take some action, of course, if he is hitting or harming other children, such as placing him in some area for a short period of time in which he gets no attention from anyone. But on the whole, reinforcing the behaviors you want usually gets the best results.

We have said that improved communication skills can reduce inappropriate behavior. So it can be seen that language training can help the child socialize more effectively.

Language training is often done by first, encouraging any appropriate vocalizations, to develop the child's speech organs. When he has learned several sounds, he often can be taught to imitate sounds the trainer makes, such as 'ba-ba-ba' or 'ma-ma-ma'. As the child learns these sounds, they can be shaped to resemble words, until he has learned some simple words. When he has learned these, the teacher and parent can make the environment reinforcing for his use of words. For instance, you can swing him in a swing only when he says, "Go!', or feed him each spoonful only when he says, 'eat'. His language can be further developed along these lines. As we stated earlier, to a large extent his social functioning is dependent upon the extent of his ability to communicate.

Physical/Occupational Therapy

Another area which we will address today is the role of physical and occupational therapy. I would like to start by stating that we do not know which of several treatments is most effective. What I can do here is present an overview of physical therapies which are in use today. Generally, the purpose of physical therapies is to stress good skeletal alignment in the spastic, training in purposeful acts in spite of involuntary motion in the athetoid, and maximizing position sense and balance in the ataxic.

Remember, we said our three-year-old had a spastic involvement of the left side. We refer to this condition as spastic hemiplegia. What are some things we might wish to do with him? Three possibilities

are: facilitate movement, proper handling, and strengthening use of the left side.

Probably the most commonly used method of physical therapy is the Bobath method. This method attempts to inhibit abnormal reflex activity and facilitate normal motor activity. Before this happens the child is given a "motor maturity evaluation" to determine the level of reflexes and muscle tone. Movement patterns are practiced consistent with the child's motor development. With the Bobath treatment, the child is physically shifted in order to reinforce equilibrium reactions. In this way the physical therapist attempts to train a reflex movement toward an upward posture.

A more controversial method of physical therapy is the Lay-Doman method. In this method, an attempt is made to train patterns of movement from fish movements, to amphibian to reptile, and finally to anthropoid movements. That is, first are trained swimming motions, followed by creeping and crawling. The theory is that these developmental layers are found in the layers of the brain. There is little research to support this hypothesis.

The Phelps and Deaver methods are used more as the child grows older. These exercises have to do with the practice of walking activities, such as parallel bars or wheelchair transfer. Braces and crutches are used to control movement and support weak muscles.

The Kabatt and Knott method has to do with increased brain excitation in order to increase voluntary control. One technique used is resisted mass-movement patterns.

The Rood approach uses heat, cold and brushing to supposedly

"activate" muscles. Like the Fay-Doman method, the Rood approach is subject to some controversy.

One of the most frequently used books in the area of physical therapy with cerebral-palsied children is Nancy Finnie's book, Handling the Young Cerebral Palsied Child at Home. In the book, the author describes suggested procedures for facilitating proper movement. In addition to general principles, she describes procedures involved in facilitating sleeping, toilet training, bathing, dressing, feeding, and other activities.

She describes three activities commonly done with normal children which should not be practiced with cerebral-palsied children. These are: pulling up to sitting from lying on back, bouncing on the floor, and throwing in the air. In the spastic child, it can cause the spine to become more rounded, the arms more bent, and an inability to bend the hips and knees in the sitting-up action. Bouncing can retard a spastic child's progress towards standing because he will not learn to balance, separate his feet or transfer his weight. Finally, throwing in the air can make him even more stiff and uncontrolled. Finnie recommends, instead, swinging him slowly in the air, keeping his legs and body well-controlled.

Some of the handling procedures described by Nancy Finnie are as follows to give some idea of treatment procedures.

A spastic child's arm is often seen pressing down and turned in at the shoulder. The elbow, wrists and fingers are bent, the forearm is turned in so that the hand faces down, and the thumb lies across the palm of the hand. The wrist can be straightened and the fingers and thumb opened by lifting the arm and turning it out at the shoulder.

Holding a spastic arm above and below a joint, in order to straighten

it, is incorrect, and will only make the limb bend more. Hold the hand over the joint so that you can straighten and turn the limb in or out in one movement.

These examples are intended to show proper methods of handling cerebral-palsied children. In handling, as in treatment, the aim is to take away support as soon as possible, so that the child and not the trainer will do the movement. The trainer must encourage the child to move actively without help, and he can only do so if you take away your hands at the right moment and then encourage the child to initiate the movement by himself.

The role of the occupational therapist overlaps and complements that of the physical therapist. Teaching the activities of daily living are of more concern to the oppupational therapist than are improvement in a specific muscle tightness. Occupational therapists also consult with teachers and administer tests of perceptual skills and visual-motor coordination.

The occupational therapist also is concerned with the last area we will address today, which is self-help skills. Three areas of particular importance for self-help skills are feeding, dressing and toilet training.

One method of teaching toileting, developed by Kurt Mahoney at Arizona State University, is by using a mechanism which indicates by "beeping" when the child wets. The child is immediately taken to the bathroom and taken through the correct procedure. The device is now manufactured under the name "Wet Alert" and has been highly successful with handicapped (and normal) children.

One way that has been used to teach both feeding and dressing

is a procedure known as backward chaining. Backward chaining simply means that you teach the last step in a process first, then the next to last and the last, and so on until the child has mastered the entire task. For example, in dressing, you may put on a child's shirt and do everything for him except pull it over his head, (or button the last button, depending on the kind of shirt and the extent of the child's fine motor skills). Once he can pull it over his head by himself, you then put on the shirt for him, except for putting in the last arm, and pulling it over his head. With this method, you take the child through all the steps, one at a time, in a backward chain, until he can put on his shirt without any assistance.

Similarly, feeding skills can be taught by backward chaining, with the addition of another procedure known as fading. With this procedure, the last step is taught first, putting the spoon in his mouth. The first time, however, you use your own hand to "prompt" and guide his efforts to put the spoon in his mouth. After the first time, you gradually "fade" your prompt so that the child takes more and more of the initiative in manipulating the spoon himself. Finally, you put the food on the spoon and hold it such that he must take the last step of grasping the spoon and taking it to his mouth, entirely by himself. You then prompt his hand in the process of putting the food on the spoon, and gradually fade the prompt, until he is able to do the entire chain of behaviors by himself.

Although we have only covered feeding, toileting and dressing, many other skills can be taught with the principles of prompting, fading and backward chaining.

Conclusion

We have discussed interventions which can be made with handicapped pre-school children. We covered the following areas:

- Cognitive
- Social/Emotional
- Physical/Occupational Therapy
- Self-Help Skills

We discussed cognitive interventions in terms of the teaching of discriminations ang receptive language. We discussed social/emotional interventions in terms of ignoring, if possible, those behaviors which are inappropriate, and encouraging by attention or other means those behaviors which we want to see more of.

We discussed the different kinds of physical therapy, and described some of Nancy Finnie's techniques for handling the cerebral palsied child, We also spoke of the role of the occupational therapist.

Finally, we covered the teaching of some self-help skills, particularly toilet training, feeding and dressing. The "wet alert" was described, as well as the techniques of prompting, fading, and backward chaining.

(Copies of the presenter/trainer format are available upon request from the authors.)

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